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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,893	09/06/2005	David E Lowery	PHRM0002-105	8487

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EXAMINER	
ULM, JOHN D	
ART UNIT	**PAPER NUMBER**
1649	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/523,893	LOWERY ET AL.	
	Examiner	Art Unit	
	John D. Ulm	1649	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,15-33 and 49-60* is/are pending in the application.

4a) Of the above claim(s) *1-4,16-18,22-27 and 31-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15,19-21,28-30 and 49-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/26/06,9/12/06,12/22/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1) Claims 1 to 4, 15 to 33 and 49 to 60 are pending in the instant application. Claims 21, 24 and 33 have been amended, claims 5 to 14 and 34 to 48 have been canceled and claims 49 to 60 have been added as requested by Applicant in the correspondence filed 09 February of 2007.

Election/Restrictions

2) Claims 1 to 4, 16 to 18, 22 to 27and 31 to 33, as well as claims 49 to 60 in so far as they relate to DmGPCR other than DmGPCR7, are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 09 February of 2007.

3) The Markush Group recited in claims 49 to 60 do not reflect a common inventive concept as required by PCT Rule 13.1 as evidenced by the Venter et al. patent (5,344,776). The text in paragraph 0002 of the instant specification defines the limitation "DmGPCR" as encompassing "Drosophila melanogaster G protein coupled receptors". The octopamine receptor described in Figures 1A to 1F of the Venter et al. patent is a Drosophila melanogaster G protein-coupled receptor. The assay that was described in Figure 4, Example 4 and Table 1 of the Venter et al. patent is fully encompassed by claim 15. Because the different receptor proteins identified in the instant specification as DmGPCR1, DmGPCR5, DmGPCR7 and DmGPCR8 lack a common substantial structural feature or combination of features that distinguishes

them as a group from related proteins of the prior art, they do not reflect a common inventive concept.

Information Disclosure Statement

4) The information disclosure statement filed 15 June of 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. That disclosure statement asserts that "[I]n accordance with 37 C.F.R. § 1.98(d), copies of the following references listed on the attached PTO Form SB/08A and PTO Form SB/08B, formerly known as PTO Form 1449 are not enclosed herewith because they were previously cited by or submitted to the U.S. Patent and Trademark Office in patent application(s) for which a claim for priority under 35 U.S.C. § 120 have been made in the instant application". However, 37 C.F.R. 1.98(d) states that "[a] copy of any patent, publication, pending U.S. application or other information, as specified in paragraph (a) of this section, listed in an information disclosure statement is required to be provided, **even if the patent, publication, pending U.S. application or other information was previously submitted** to, or cited by, the Office in an earlier application, **unless" "the earlier application is properly identified in the information disclosure statement** and is relied on for an earlier effective filing date under 35 U.S.C. 120". The instant application claims priority under 35 U.S.C. § 120 from two previously filed U.S applications. The disclosure statement filed 15 June 2005 does not comply

with 37 C.F.R. 1.98(d) because it fails to identify either of those two applications and because it fails to indicate in which of those two previously filed applications a copy of each of the cited references is to be found.

Specification

5) The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. See line 11 of page 75, for example. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01(p), which states that:

> "When a patent application with embedded hyperlinks and/or other forms of browser-executable code issues as a patent (or is published as a patent application publication) and the patent document is placed on the USPTO web page, when the patent document is retrieved and viewed via a web browser, the URL is interpreted as a valid HTML code and it becomes a live web link. When a user clicks on the link with a mouse, the user will be transferred to another web page identified by the URL, if it exists, which could be a commercial web site. USPTO policy does not permit the USPTO to link to any commercial sites since the USPTO exercises no control over the organization, views or accuracy of the information contained on these outside sites. If hyperlinks and/or other forms of browser-executable code are embedded in the text of the patent application, examiners should object to the specification and indicate to applicants that the embedded hyperlinks and/or other forms of browser-executable code are impermissible and require deletion."

Correction is required.

Claim Objections

6) Claims 49 to 60 are objected to as reciting an improper Markush Group. M.P.E.P. 803.02 states that:

> "Since the decisions in In re Weber **,198 USPQ 328 (CCPA 1978); and In re Haas, 198 USPQ 334 (CCPA 1978), it is improper for the Office to refuse to examine that which applicants regard as their invention, unless the subject matter in a claim lacks unity of invention, In re Harnish , 631 F.2d 716, 206 USPQ 300 (CCPA 1980); Ex Parte Hozumi , 3 USPQ2d 1059 (Bd. Pat. App. & Int. 1984). Broadly, unity of invention exists where compounds included within a Markush group (1) share a common utility and (2) share a substantial structural feature disclosed as being essential to that utility."

As explained above, the Venter et al. patent (5,344,776) shows that the different receptor proteins identified in the instant specification as DmGPCR1, DmGPCR5, DmGPCR7 and DmGPCR8 lack a common substantial structural feature or combination of features that distinguishes them as a group from related proteins of the prior art, and the method steps recited in the claims are not distinguishing.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7) Claims 15, 19 to 21 and 55 to 60 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The instant claims encompass a process as it occurs in nature.

8) Claims 15, 19 to 21, 28 to 30 and 49 to 60 are rejected under 35 U.S.C. § 101 because they are drawn to an invention with no apparent or disclosed specific

and substantial credible utility. In so far as the instant claims are drawn to a binding assay employing a protein identified in the instant specification as "DmGPCR7" and a DmGPCR7 binding partner, the instant application does not disclose a specific biological role for DmGPR7 or its established relationship to a specific physiological process that one would wish to manipulate for a desired effect. The text in paragraph 00016 of the instant specification states "DmGPCRs **may** play a role as a key component, for example, in regulating neuropeptide binding and/or signaling" and "are thus useful in the search for novel agents that can modify and/or control binding and/or signaling by neuropeptides or other agents". The text in paragraph 00037 teaches that "DmGPCR binding partners that stimulate DmGPCR activity are useful as agonists to enhance or prolong DmGPCR signaling and this way to interfere with normally activated receptor signaling pathways" whereas "DmGPCR binding partners that block ligand-mediated DmGPCR signaling are useful as DmGPCR antagonists to interfere with normal DmGPCR signaling and impair receptor-mediated effects". The text in paragraph 00038 alleges that "the invention provides methods for treating a disease or abnormal condition caused by an ectoparasite by administering to a subject in need of such treatment a substance that **modulates** the activity" of a DmGPCR polypeptide of the instant invention. The specification essentially asserts that the claimed method can be employed in the identification of agonists and antagonist of a DmGPCR protein and that such agonists **and** antagonists have insecticidal activity. Claims 15, 19 to 21 and 55 to 60 also encompass a method of treating by administering such compound. However, there is absolutely no evidence of record that a compound which modulates

DmGPCR7 has any insecticidal activity at all. Paragraph 000333 of the instant specification identifies several compounds that have been determined by Applicant to agonize a DmGPCR7 protein of the instant invention and yet there is no evidence that any one or more of these compounds possess the asserted insecticidal activity.

It is clear from the instant specification that the putative receptor protein described therein as DmGPCR7 is what is referred to as an "orphan receptor" in the art. This is a protein whose cDNA has been isolated because of it encodes an amino acid sequence that is similar to that of one or more known receptor proteins or putative receptor proteins. The instant situation is discussed in Example 12 of the "REVISED INTERIM UTILITY GUIDELINES TRAINING MATERIALS" (http://ptoweb.uspto.gov/patents/filecab/documents/Utility.pdf - 188.0KB, 28 Feb. 2000), which explains why an isolated nucleic acid encoding an "orphan receptor", the protein encoded thereby and a assay employing that protein lack utility in the absence of the disclosure of a specific role for either the nucleic acid or protein in a known disease or disorder or a physiological process which one would wish to manipulate for clinical effect.

There is little doubt that, after complete characterization, a DmGPCR7 receptor protein of the instant invention and an assay identifying agonists and antagonists thereto, as well as a method of administering such agonists and/or antagonists, may each be found to have a specific and substantial credible utility. This further characterization, however, is part of the act of invention and until it has been undertaken and successfully completed Applicant's claimed invention is not useful in its currently available form. Whereas one could readily employ a DmGPCR7 protein of the instant

invention in an assay to identify ligands thereto, as described in paragraph 000373 of the specification, the information obtained from such an assay would be of little practical use until one discovers the identity of those physiological processes that are mediated by the interaction of a ligand with that receptor. The instant specification has demonstrated that DmGPCR7 is activated by leucokinins. Paragraph 00012 therein discloses that "leucokinins are a group of widespread insect hormones that stimulate gut motility and tubule fluid secretion rates". However, the specification fails to provide any evidence that the known activities of leucokinins are mediated by the activation of DmGPCR7 or that the stimulation or inhibition of these activities is detrimental to an insect. Because the instant specification has failed to credibly identify a physiological process which has been shown to be influenced by the activation or inhibition of a DmGPCR7 protein of the instant invention an artisan would have no way of predicting what effects the administration of an agonist or antagonist thereto would have upon the organism to which it has been administered. If one can not predict the effects that the administration of an activator or inhibitor of DmGPCR7 is going to have on an organism then it is unclear as to what practical benefit is derived by the public from the identification of that activator or inhibitor.

The instant situation is directly analogous to that which was addressed in *Brenner v. Manson*, 148 U.S.P.Q. 689 (Sus. Ct, 1966), in which a novel compound which was structurally analogous to other compounds which were known to possess anti-cancer activity was alleged to be potentially useful as an anti-tumor agent in the absence of evidence supporting this utility. The court expressed the opinion that all

chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation. However, the court held that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. § 101, which requires that an invention must have either an immediately obvious or fully disclosed "real world" utility. The court held that:

> "The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility", " [u]nless and until a process is refined and developed to this point-where specific benefit exists in currently available form-there is insufficient justification for permitting an applicant to engross what may prove to be a broad field", and "a patent is not a hunting license", " [i]t is not a reward for the search, but compensation for its successful conclusion."

The instant claims are drawn to a process that produces information. Before the information produced by the claimed process is useful for the identification of compounds that are effective in the treatment of ectoparasitic infections in its currently available form, one must establish a nexus between the activation or inhibition of DmGPCR7 and a selectively detrimental effect upon an ectoparasite. It is noted that DmGPCR7 is a naturally occurring protein from the fruit fly *Drosophila melanogaster*. There is no evidence of record which supports the position that *D. melanogaster* is known to engage in ectoparasitic activity or that the activity of DmGPCR7 is predictive of the activity of an analogous protein in an insect known to engage in such activity. Therefore, Applicant leaves to the practitioner of the art to establish or reasonably confirm the usefulness of the claimed process in the identification of insecticidal compounds and the administration of those compounds for beneficial effect. As indicated above, the courts have determined that a patent is not a hunting license, it is

not a reward for the search, but compensation for its successful conclusion, thereby precluding the need for additional experimentation when that experimentation is needed to establish or reasonably confirm a specific and substantial utility for a claimed invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9) Claims 15, 19 to 21, 28 to 30 and 49 to 60 are rejected under 35 U.S.C. § 112, first paragraph, as failing to adequately teach how to use the instant invention for those reasons given above with regard to the rejection of these claims under 35 U.S.C. § 101.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10) Claims 19 to 21, 28 to 30 and 49 to 60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims are vague and indefinite because they refer to "DmGPCR7 (SEQ ID NO:17)" as recited in claim 19. The sequence presented in SEQ ID NO:17 of the instant application is a nucleotide sequence. For examination purposes, the term "DmGPCR7" has been examined in reference to the amino acid sequence presented in SEQ ID NO:18 of the sequence listing because the text in paragraph 00019 of the instant specification

indicates that the amino acid sequence presented in SEQ ID NO:18 is encoded by the nucleotide sequence presented in SEQ ID NO:17. This conclusion is further supported by the table presented on page 71 of the instant specification, which expressly identifies SEQ ID NO:18 as the amino acid sequence of DmGPCR7.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11) Claim 15 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by the Venter et al. patent (5,344, 776. As indicated above, the text in paragraph 0002 of the instant specification defines the limitation "DmGPCR" as encompassing "Drosophila melanogaster G protein coupled receptors". The octopamine receptor described in Figures 1A to 1F of the Venter et al. patent is a Drosophila melanogaster G protein coupled receptor. Therefore, the assay that was described in Figure 4, Example 4 and Table 1 of the Venter et al. patent is fully encompassed by claim 15.

12) Claims 15, 19 to 21 and 55 to 60 are rejected under 35 U.S.C. 102(b) as being anticipated by the O'Donnell et al. publication (J. Exp. Biol. 199(5):1163-1175, 01 May 1996). These claims encompass any process that results in Leucokinin-1 coming into contact with DsGPCR7. The instant specification discloses that DmGPCR7 is a naturally occurring G protein-coupled receptor that is produced by *D. melanogaster.* Paragraph 000373 therein states that "DmGPCR7 was identified as a calcium-signaling

leucokinin receptor" at which LK-1 (LK-I) was shown to be the most potent agonist of those leucokinins peptides tested, whereas LK-8 (LK-VIII) was shown to be the least potent. The facts of record support the conclusion that the instant claims encompass the assay the was described in Figure 5 on page 1168 of O'Donnell et al., in which the malpighian tubules employed therein would be expected to inherently contain DmGPCR7. There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure at the time of invention, but only that the subject matter is in fact inherent in the prior art reference. Schering Corp. v. Geneva Pharm. Inc., 339 F.3d 1373, 1377, 67 USPQ2d 1664, 1668 (Fed. Cir. 2003). See M.P.E.P. 2112 II.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John D. Ulm whose telephone number is (571) 272-0880. The examiner can normally be reached on 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on (571) 272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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